UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

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PLANS
Timber Management-Eldorado
Silver Fork-Alder Creek W.C.

Placerville, California,
January 19, 1938.

REPORT ON CUTTING METHOD STUDY

Silver Fork-Alder Creek

Working Circle

Eldorado National Forest.

TRANSFERRED

Arnold N. Weber,
Associate Forester

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REPORT ON CUTTING METHOD STUDY

SILVER FORK-ALDER CREEK

WORKING CIRCLE

ELDORADO NATIONAL FOREST

REGION 5

Arnold N. Weber
ASSOCIATE FORESTER

Approved: Jan 22 1938
Louis F Smith
Forest Supervisor

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TIMBER MANAGEMENT
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INTRODUCTION:

The comments made by the reviewing officers of the Washington Office on the management plan for the Silver Fork-Alder Creek Working Circle and the criticism of inspecting officers, discloses that the marking policy for Region 5 is a subject for critical review.

OBJECT OF STUDY:

The object of the study is to contrast the effect of the application of different marking systems on the timberstand and to ascertain the system that will meet the criticism.

AREA STUDIED:

The study was made in the Silver Fork Block of the Silver Fork-Alder Creek Working Circle, Eldorado National Forest.

The timberstand included in the study comprises six sites and types as taken from A. E. Wieslander's site and vegetation map. The stand composition is as follows:

Ponderosa Pine	49.8	per cent
Jeffrey Pine	1.9	" "
Sugar Pine	17.0	" "
White Fir	16.5	" "
Incense Cedar	14.8	" "
Total	100.0	" "

CUTTING TREATMENT:

The study is based on five marking systems, as follows:

A. Group selection and selection systems.
B. Improvement cutting.
C. Quality improvement cutting.
D. Light cutting based on Keen's modification of Dunning's tree classification. (See Journal of Forestry, October 1936, Vol.34, No. 10, Pages 919 to 927 inclusive.)
E. Quality light cutting based on Keen's modification of Dunning's tree classification.

The first method of cutting, group selection and selection, is the system used in Region 5. This method involves cutting some of the thrifty mature trees and all of the mature and overmature trees. The application of this system has resulted in removing approximately 80 per cent of the total volume of the stand.

The improvement cutting method removes only those trees that must be removed by reason of disease, injury, form and insect susceptibility. This can be classed as the "must cut" method since these types of trees will be removed by all cutting systems.

The quality improvement cutting is based on the same principles as the improvement cutting with the addition that all ponderosa and sugar pine trees have two or more number 1 quality logs will be cut.

The light cutting method is based on Keen's modification of the Dunning tree classification. This system involves cutting in general, all trees in Classes 1C and D, 2C and D, 3C and D, 4B, 4C and 4D together with all trees included in the improvement cutting.

The quality light cutting is based on the same principles as outlined in the light cutting method with the addition that all ponderosa and sugar pine trees in Classes 3B and 4A with 2 or more number 1 quality logs will be cut.

DATA:

The data for the study was obtained by running 49.5 acres of log quality strip. The information collected included log quality by cut and leave by Dunning tree class and by Keen tree class. Further, a separate tally was kept of trees that would be removed for improvement reasons. The field work was done by Assistant Forester B. E. Parsons, Junior Forester L. R. Thomas and Junior Assistant to Technician O. C. Stearns.

OFFICE PROCEDURE:

The field data was assembled by sites and types. Spot sheets were made for all trees cut and left under the group selection and light cutting methods. The improvement cutting trees were indicated by underlining. The next step was to draw up stock and stand tables. From this data the average annual growth was determined by reference to Dunning's reserve growth formula. As a final step a table was prepared showing the volume of cut and leave by species under the cutting systems.

Further, to show the relation of the cutting methods to quality a log quality spot sheet for ponderosa and sugar pine was made. This data was segregated to show the volume and percentage of the marked material by log class and diameter groups. As a final step the Region 5 average lumber selling prices were applied.

RESULTS OF STUDY:

The distribution of the cut and leave material by species and by sites and types under the five cutting methods is shown in Tables I, II and III.

The marking percentage under the group selection method approximates 80 per cent irrespective of site and type.

The improvement cutting system indicates, in some instances, a correlation between volume removed and site and type. In general, however, there is no correlation shown and this is to be expected by reason of the tree species being more or less susceptible to disease. Further, with respect to the pine species the factor of susceptibility to insect attack is given consideration in marking and in great part is directly responsible for the large volume removed.

The quality improvement method indicates that the inclusion of trees with 2 or more number 1 quality logs in the cutting increases the volume removed by varying percentages (from 3.6 per cent for SPW-175 to 16.7 per cent for SPDW-150) The significant fact concerning this method is that the percentage of pine in the residual stand is the least of all the systems.

The light cutting method indicates that the percentage of removal within individual types and sites fluctuates from 56.5 per cent to 85.4 per cent for an average of 65 per cent. There is no correlation shown between volume removed and site and type. The significant fact revealed is that the use of the Keen tree classes results in an average marking percentage of 65 per cent.

The quality light cutting indicates that the percentage of removal differs slightly from the light cutting. The marking percentage is increased by 1.2 per cent.

TABLE I

DISTRIBUTION OF CUT AND LEAVE MATERIAL BY SPECIES FOR SITES AND TYPES
UNDER DIFFERENT CUTTING TREATMENT

	PONDEROSA PINE			SUGAR PINE			WHITE FIR			INCENSE CEDAR			JEFFREY PINE			TOTAL		
	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total
SPDW - 150 - 4 acres																		
A Group Selection																		
Vol, per A.	24,717	6,908	31,625	9,835	1,460	11,295	5,345	430	5,775	5,590	1,322	6,912	190	58	248	45,677	10,178	55,855
Per cent	78.2	21.8	100.0	87.1	12.9	100.0	92.5	7.5	100.0	80.9	19.1	100.0	76.6	23.4	100.0	81.8	18.2	100.0
B Improvement Cutting																		
Vol. per A.	11,800	19,825	31,625	2,145	9,150	11,295	2,713	3,062	5,775	3,007	3,905	6,912		248	248	19,665	36,190	55,855
Per cent	37.3	62.7	100.0	19.0	81.0	100.0	47.0	53.0	100.0	43.5	56.5	100.0		100.0	100.0	35.2	64.8	100.0
C Quality Improvement																		
Vol. per A.	16,895	14,730	31,625	6,920	4,375	11,295	2,713	3,062	5,775	3,007	3,905	6,912		248	248	29,535	26,320	55,855
Per cent	53.4	46.6	100.0	61.3	38.7	100.0	47.0	53.0	100.0	43.5	56.5	100.0		100.0	100.0	52.9	47.1	100.0
D Keen's, leaving 1,2,3AB & 4A less must cut																		
Vol. per A.	13,275	18,350	31,625	9,835	1,460	11,295	3,415	2,360	5,775	5,125	1,787	6,912	190	58	248	31,840	24,015	55,855
Per cent	42.0	58.0	100.0	87.1	12.9	100.0	59.1	40.9	100.0	74.1	25.9	100.0	76.6	23.4	100.0	57.0	43.0	100.0
E Keen's, leaving 1,2,3AB & 4A, less 3B&4A with (2+ #1 logs)																		
Vol. per A.	16,910	14,715	31,625	9,835	1,460	11,295	3,415	2,360	5,775	5,125	1,787	6,912	190	58	248	35,475	20,380	55,855
Per cent	53.5	46.5	100.0	87.1	12.9	100.0	59.1	40.9	100.0	74.1	25.9	100.0	76.6	23.4	100.0	63.5	36.5	100.0
SP - 175 - 27.75																		
A Group Selection																		
Vol. per A.	18,911	4,844	23,755	3,928	1,250	5,178	6,454	1,595	8,049	5,682	1,576	7,258	182	11	193	35,157	9,276	44,433
Per cent	79.6	20.4	100.0	75.8	24.2	100.0	80.2	19.8	100.0	78.3	21.7	100.0	94.3	5.7	100.0	79.1	20.9	100.0
B Improvement Cutting																		
Vol. per A.	8,698	15,057	23,755	1,579	3,599	5,178	2,701	5,348	8,049	2,322	4,936	7,258		193	193	15,300	29,133	44,433
Per cent	36.6	63.4	100.0	30.5	69.5	100.0	33.6	66.4	100.0	32.0	68.0	100.0		100.0	100.0	34.4	65.6	100.0
C Quality Improvement																		
Vol. per A.	11,167	12,588	23,755	1,794	3,384	5,178	2,701	5,348	8,049	2,322	4,936	7,258		193	193	17,984	26,449	44,433
Per cent	47.0	53.0	100.0	34.6	65.4	100.0	33.6	66.4	100.0	32.0	68.0	100.0		100.0	100.0	40.5	59.5	100.0
D Keen's, leaving 1,2,3AB & 4A less must cut																		
Vol. per A.	14,488	9,267	23,755	2,841	2,337	5,178	5,616	2,433	8,049	4,582	2,676	7,258	182	11	193	27,709	16,724	44,433
Per cent	61.0	39.0	100.0	54.9	45.1	100.0	69.8	30.2	100.0	63.1	36.9	100.0	94.3	5.7	100.0	62.4	37.6	100.0
E Keen's leaving 1,2,3AB & 4A, less 3B&4A with (2+ #1 logs)																		
Vol. per A.	14,829	8,926	23,755	2,841	2,337	5,178	5,616	2,433	8,049	4,582	2,676	7,258	182	11	193	28,050	16,383	44,433
Per cent	62.4	37.6	100.0	54.9	45.1	100.0	69.8	30.2	100.0	63.1	36.9	100.0	94.3	5.7	100.0	63.1	36.9	100.0

TABLE II

DISTRIBUTION OF CUT AND LEAVE MATERIAL BY SPECIES FOR SITES AND TYPES
UNDER DIFFERENT CUTTING TREATMENT

	PONDEROSA PINE			SUGAR PINE			WHITE FIR			INCENSE CEDAR			JEFFREY PINE			TOTAL		
	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total
SPW - 175 - 3½ acres																		
A Group Selection																		
Vol. per A.	2,288	83	2,371	13,583	2,363	15,946	5,117	2,866	7,983	4,635	865	5,500		631	631	25,623	6,808	32,431
Per cent	96.5	3.5	100.0	85.2	14.8	100.0	64.1	35.9	100.0	84.3	15.7	100.0		100.	100.0	79.0	21.0	100.0
B Improvement Cutting																		
Vol. per A.	1,128	1,243	2,371	9,375	6,571	15,946	1,292	6,691	7,983		5,500	5,500		631	631	11,795	20,636	32,431
Per cent	47.6	52.4	100.0	58.8	41.2	100.0	16.2	83.8	100.0		100.0	100.0		100.0	100.0	36.4	63.6	100.0
C Quality Improvement																		
Vol. per A.	1,128	1,243	2,371	10,540	5,406	15,946	1,292	6,691	7,983		5,500	5,500		631	631	12,960	19,471	32,431
Per cent	47.6	52.4	100.0	66.1	33.9	100.0	16.2	83.8	100.0		100.0	100.0		100.0	100.0	40.0	60.0	100.0
D Keen's, leaving 1,2,3AB & 4A, less must cut																		
Vol. per A.	1,428	943	2,371	10,568	5,378	15,946	2,180	5,803	7,983	4,157	1,343	5,500		631	631	18,333	14,098	32,431
Per cent	60.0	40.0	100.0	66.3	33.7	100.0	27.3	72.7	100.0	75.6	24.4	100.0		100.0	100.0	56.5	43.5	100.0
E Keen's, leaving 1,2,3AB & 4A, less 3B&4A with (2+ #1 logs)																		
Vol. per A.	1,428	943	2,371	10,568	5,378	15,946	2,180	5,803	7,983	4,157	1,343	5,500		631	631	18,333	14,098	32,431
Per cent	60.0	40.0	100.0	66.3	33.7	100.0	27.3	72.7	100.0	75.6	24.4	100.0		100.0	100.0	56.5	43.5	100.0
P - 150 - 9 acres																		
A Group Selection																		
Vol. per A.	23,328	4,610	27,938	6,040	593	6,633	2,804	408	3,212	2,777	1,326	4,103	1,018	443	1,461	35,967	7,380	43,347
Per cent	83.5	16.5	100.0	91.0	9.0	100.0	87.3	12.7	100.0	67.7	32.3	100.0	69.7	30.3	100.0	83.0	17.0	100.0
B Improvement Cutting																		
Vol. per A.	10,897	17,041	27,938	2,750	3,883	6,633	1,499	1,713	3,212	1,284	2,819	4,103	497	964	1,461	16,927	26,420	43,347
Per cent	39.0	61.0	100.0	41.5	58.5	100.0	46.7	53.3	100.0	31.3	68.7	100.0	34.0	66.0	100.0	39.1	60.9	100.0
C Quality Improvement																		
Vol. per A.	14,852	13,086	27,938	3,773	2,860	6,633	1,499	1,713	3,212	1,284	2,819	4,103	497	964	1,461	21,905	21,442	43,347
Per cent	53.2	46.8	100.0	56.9	43.1	100.0	46.7	53.3	100.0	31.3	68.7	100.0	34.0	66.0	100.0	50.5	49.5	100.0
D Keen's, leaving 1,2,3AB & 4A less must cut																		
Vol. per A.	18,466	9,472	27,938	5,458	1,175	6,633	2,804	408	3,212	2,307	1,796	4,103	1,018	443	1,461	30,053	13,294	43,347
Per cent	66.1	33.9	100.0	82.3	17.7	100.0	87.3	12.7	100.0	56.2	43.8	100.0	69.7	30.3	100.0	69.3	30.7	100.0
E Keen's, leaving 1,2,3AB & 4A, less 3B&4A with (2+ #1 logs)																		
Vol. per A.	20,022	7,916	27,938	5,911	722	6,633	2,804	408	3,212	2,307	1,796	4,103	1,018	443	1,461	32,062	11,285	43,347
Per cent	71.7	28.3	100.0	89.1	10.9	100.0	87.3	12.7	100.0	56.2	43.8	100.0	69.7	30.3	100.0	74.0	26.0	100.0

TABLE III

DISTRIBUTION OF CUT AND LEAVE MATERIAL BY SPECIES FOR SITES AND TYPES
UNDER DIFFERENT CUTTING TREATMENT

	PONDEROSA PINE			SUGAR PINE			WHITE FIR			INCENSE CEDAR			JEFFREY PINE			TOTAL		
	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total
SPW - 150 - 1¼																		
A Group Selection																		
Vol. per A.	38,736	11,704	50,440	4,592		4,592	960		960	14,976		14,976				59,264	11,704	70,968
Per cent	76.8	23.2	100.0	100.0		100.0	100.0		100.0	100.0		100.0				83.5	16.5	100.0
B Improvement Cutting																		
Vol. per A.	18,040	32,400	50,440	4,592		4,592	960		960	12,824	2,152	14,976				36,416	34,552	70,968
Per cent	35.8	64.2	100.0	100.0		100.0	100.0		100.0	85.6	14.4	100.0				51.3	48.7	100.0
C Quality Improvement																		
Vol. per A.	22,712	27,728	50,440	4,592		4,592	960		960	12,824	2,152	14,976				41,088	29,880	70,968
Per cent	45.0	55.0	100.0	100.0		100.0	100.0		100.0	85.6	14.4	100.0				57.9	42.1	100.0
D Keen's; leaving 1,2,3AB & 4A less must cut																		
Vol. per A.	29,920	20,520	50,440	4,592		4,592	960		960	12,824	2,152	14,976				48,296	22,672	70,968
Per cent	59.3	40.7	100.0	100.0		100.0	100.0		100.0	85.6	14.4	100.0				68.1	31.9	100.0
E Keen's; leaving 1,2,3AB & 4A, less 3B&4A with (2+ #1 logs)																		
Vol. per A.	29,920	20,520	50,440	4,592		4,592	960		960	12,824	2,152	14,976				48,296	22,672	70,968
Per cent	59.3	40.7	100.0	100.0		100.0	100.0		100.0	85.6	14.4	100.0				68.1	31.9	100.0
SPWR - 175 - 4																		
A Group Selection																		
Vol. per A.	810		810	17,547	53	17,600	12,106	2,702	14,808	5,425	1,265	6,690	4,085	452	4,537	39,973	4,472	44,445
Per cent	100.0		100.0	99.7	0.3	100.0	81.8	18.2	100.0	81.1	18.9	100.0	90.0	10.0	100.0	89.9	10.1	100.0
B Improvement Cutting																		
Vol. per A.		810	810	11,520	6,080	17,600	5,796	9,012	14,808	3,648	3,042	6,690	1,803	2,734	4,537	22,767	21,678	44,445
Per cent		100.0	100.0	65.4	34.6	100.0	39.1	60.9	100.0	54.5	45.5	100.0	39.7	60.3	100.0	51.2	48.8	100.0
C Quality Improvement																		
Vol. per A.	810		810	12,425	5,175	17,600	5,796	9,012	14,808	3,648	3,042	6,690	1,803	2,734	4,537	24,482	19,963	44,445
Per cent	100.0		100.0	70.6	29.4	100.0	39.1	60.9	100.0	54.5	45.5	100.0	39.7	60.3	100.0	55.1	44.9	100.0
D Keen's; leaving 1,2,3AB & 4A less must cut																		
Vol. per A.	810		810	17,547	53	17,600	10,958	3,850	14,808	4,550	2,140	6,690	4,085	452	4,537	37,950	6,495	44,445
Per cent	100.0		100.0	99.7	0.3	100.0	74.0	26.0	100.0	68.0	32.0	100.0	90.0	10.0	100.0	85.4	14.6	100.0
E Keen's: leaving 1,2,3AB & 4A, less 3B&4A with (2+ #1 logs)																		
Vol. per A.	810		810	17,547	53	17,600	10,958	3,850	14,808	4,550	2,140	6,690	4,085	452	4,537	37,950	6,495	44,445
Per cent	100.0		100.0	99.7	0.3	100.0	74.0	26.0	100.0	68.0	32.0	100.0	90.0	10.0	100.0	85.4	14.6	100.0

Table IV shows for the entire area included in the study the cut and leave per acre, the percentage cut and left by species, percentage cut and left by total of all species, and the per cent composition of the stand after cutting under different methods of treatment. The interesting fact shown by this table is that irrespective of the type of cutting employed the percentage composition of the stand remains approximately the same.

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Management Plans-Eldorado
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TABLE IV

TABLE SHOWING CUT AND LEAVE UNDER DIFFERENT METHODS OF CUTTING

Based on 49.50 Acres Quality Cruise

	PONDEROSA PINE			SUGAR PINE			WHITE FIR			INCENSE CEDAR			JEFFREY PINE			TOTAL		
	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total	Cut	Leave	Total
A Standard Group Selection Cutting																		
Volume Cut and Left per acre	18,046	4,413	22,459	6,589	1,098	7,687	5,924	1,424	7,348	5,286	1,395	6,681	632	173	805	36,477	8,503	44,980
Per cent Cut and Left by species	80.4	19.6	100.0	85.7	14.3	100.0	80.6	19.4	100.0	79.1	20.9	100.0	78.5	21.5	100.0	81.1	18.9	100.0
Per cent Cut and Left all species	40.1	9.8	49.9	14.7	2.4	17.1	13.2	3.2	16.4	11.7	3.1	14.8	1.4	0.4	1.8	81.1	18.9	100.0
Per cent Stand Composition after cutting		51.9			12.9			16.8			16.4			2.0			100.0	
B Improvement Cutting (Must Cuts)																		
Volume Cut and Left per acre	8,346	14,113	22,459	3,268	4,419	7,687	2,590	4,758	7,348	2,397	4,284	6,681	236	569	805	16,837	28,143	44,980
Per cent Cut and Left by species	37.2	62.8	100.0	42.5	57.5	100.0	35.3	64.7	100.0	35.9	64.1	100.0	29.3	70.7	100.0	37.4	62.6	100.0
Per cent Cut and Left all species	18.5	31.4	49.9	7.3	9.8	17.1	5.8	10.6	16.4	5.3	9.5	14.8	0.5	1.3	1.8	37.4	62.6	100.0
Per cent Stand Composition after cutting		50.2			15.7			16.9			15.2			2.0			100.0	
C Quality Improvement Cutting (Must Cuts plus 2+ #1 Log Trees)																		
Volume Cut and Left per acre	11,045	11,414	22,459	4,116	3,571	7,687	2,590	4,758	7,348	2,397	4,284	6,681	236	569	805	20,384	24,596	44,980
Per cent Cut and Left by species	49.2	50.8	100.0	53.5	46.5	100.0	35.3	64.7	100.0	35.9	64.1	100.0	29.3	70.7	100.0	45.3	54.7	100.0
Per cent Cut and Left all species	24.5	25.4	49.9	9.2	7.9	17.1	5.8	10.6	16.4	5.3	9.5	14.8	0.5	1.3	1.8	45.3	54.7	100.0
Per cent Stand Composition after cutting		46.4			14.5			19.4			17.4			2.3			100.0	
D Light Cutting based on Keen's Modification Dunning tree class system																		
Volume Cut and Left per acre	13,474	8,985	22,459	5,661	2,026	7,687	4,998	2,350	7,348	4,388	2,293	6,681	632	173	805	29,153	15,827	44,980
Per cent Cut and Left by species	60.0	40.0	100.0	73.6	26.4	100.0	68.0	32.0	100.0	65.7	34.3	100.0	78.5	21.5	100.0	64.8	35.2	100.0
Per cent Cut and Left all species	29.9	20.0	49.9	12.6	4.5	17.1	11.1	5.3	16.4	9.7	5.1	14.8	1.4	0.4	1.8	64.8	35.2	100.0
Per cent Stand Composition after cutting		56.8			12.8			14.8			14.5			1.1			100.0	
E Light Cutting plus Quality based on Keen's Modification Dunning Tree class system																		
Volume Cut and Left per acre	14,242	8,217	22,459	5,743	1,944	7,687	4,998	2,350	7,348	4,388	2,293	6,681	632	173	805	30,003	14,977	44,980
Per cent Cut and Left by species	63.4	36.6	100.0	74.7	25.3	100.0	68.0	32.0	100.0	65.7	34.3	100.0	78.5	21.5	100.0	66.7	33.3	100.0
Per cent Cut and Left all species	31.7	18.2	49.9	12.8	4.3	17.1	11.1	5.3	16.4	9.7	5.1	14.8	1.4	0.4	1.8	66.7	33.3	100.0
Per cent Stand Composition after cutting		54.8			13.0			15.7			15.3			1.2			100.0	

Table V shows the average annual growth for the reserve and pole stand for the group selection and light cutting methods and for the reserve stand under the improvement cutting method as computed by the Dunning growth formulae.

TABLE V

GROSS AVERAGE ANNUAL GROWTH, RESERVE AND POLE STANDS FOR GROUP SELECTION AND LIGHT CUTTING

Site and Type	Group Selection			Light Cutting			Imp. Cutting
	Reserve	Pole	Total	Reserve	Pole	Total	Reserve
P 150	105	5	110	160	4	164	250
SP 175	204	23	227	290	21	311	390
SPW 150	50	20	70	106	18	124	148
SPW 175	180	13	193	304	11	315	400
SPWR 175	145	99	244	168	98	266	376
SPDW 150	135	71	206	210	69	279	255
Average	170	29	199	246	27	273	347
% Increase						37.7	

The pole growth in the improvement cutting method has not been calculated in view of the small volume removed and the unknown effect this will have.

The gross average annual growth is greatest for the improvement cutting method, followed by the light cutting with the selection method last.

The normal loss for the group selection method has been established at 15 per cent by Meyers and others. This percentage would not be applicable to the improvement or light cutting methods by reason of the larger volume of mature material left in the stand. Pearson in "Growth and Yield of Cutover Stands" in the December 1937, Vol. 35, No. 12, issue of the Journal of Forestry, states "as shown by Table 6 and already pointed out, mortality in terms of volume is greatest among the large, mature trees." As a result it is to be concluded that in view of the increased volume of mature classes left the mortality loss will be increased. Pearson in the Southwest found the mortality loss under group selection to be 18.5 per cent and for light cutting to be 26.2 per cent. It appears correct, therefore, to assume a mortality rate of 25 per cent for the light cutting method and 30.0 per cent for the improvement cutting method. The net annual growth is shown in Table IV.?

VI

TABLE VI

NET AVERAGE ANNUAL GROWTH GROUP SELECTION AND LIGHT CUTTING

Site and Type		Group Selection	Light Cutting	Imp. Cutting
P	150	94	123	175
SP	175	193	233	273
SPW	150	60	93	104
SPW	175	164	236	280
SPWR	175	207	199	263
SPDW	150	175	209	179
Average		169	205	243
% Increase			21.3	

The following tables show the distribution of marked material and selling prices for ponderosa and sugar pine by diameter groups based on 1934-35-36 regional averages for three of the cutting methods. These tables are included to show the relative values produced by the pine species under three of the cutting methods.

TABLE VII

DISTRIBUTION OF MARKED MATERIAL AND SELLING PRICES BY D.I.B. GROUPS
CUTTING METHODS COMPARED

SUGAR PINE

SELECTION SYSTEM

Basis 49½ Acres

D.I.B. Groups	6-9	10-13	14-17	18-21	22-25	26-29	30-33	34-37	38-41	42-45	46-49	50-53	54-57	58-61	62-65	66-69	Total
#1 Logs Gross Volume					33	58	359	1218	1300	968	1405	390		522	588	700	7541
% of #1 Logs					0.44	0.77	4.76	16.15	17.24	12.84	18.63	5.17		6.92	7.80	9.28	100.00
% of Total					0.09	0.16	1.02	3.45	3.68	2.75	3.98	1.10		1.48	1.67	1.98	21.36
Selling Price					30.307	33.309	36.481	38.899	40.697	41.146	41.985	42.285		42.075	42.075	42.075	40.814
#2 Logs Gross Volume				30	119	216	790	760	1151	566	1293	412	471				5808
% of #2 Logs				0.52	2.05	3.72	13.60	13.09	19.82	9.74	22.26	7.09	8.11				100.00
% of Total				0.08	0.34	0.61	2.24	2.15	3.26	1.60	3.66	1.17	1.34				16.45
Selling Price				20.402	22.559	25.709	27.642	29.041	30.008	30.225	30.880	30.938	30.715				29.536
#3 Logs Gross Volume	6	200	882	1795	3062	3380	3231	3722	1846	1688	491	569	227	532	319		21,950
% of #3 Logs	0.03	0.91	4.02	8.18	13.95	15.40	14.72	16.96	8.41	7.69	2.24	2.59	1.03	2.42	1.45		100.00
% of Total	0.02	0.57	2.50	5.09	8.67	9.58	9.15	10.55	5.23	4.78	1.39	1.61	0.64	1.51	0.90		62.19
Selling Price	28.546	23.494	20.919	20.084	19.767	21.552	22.899	24.122	25.079	25.096	25.886	25.886	25.886	25.886	25.886		22.802
Total Gross Volume	6	200	882	1825	3214	3654	4380	5700	4297	3222	3189	1371	698	1054	907	700	35,299
% of Total	0.02	0.57	2.50	5.17	9.10	10.35	12.41	16.15	12.17	9.13	9.03	3.88	1.98	2.99	2.57	1.98	100.00
Cull Per cent	0.	1.25	2.5	3.3	4.1	4.9	5.7	6.5	7.3	8.1	8.9	9.7	10.25	10.65	11.05	11.05	6.710
Total Net Volume	6	198	860	1765	3082	3475	4130	5329	3983	2961	2905	1238	626	942	807	623	32,930
% by D.I.B. Groups	0.02	0.60	2.61	5.36	9.36	10.55	12.54	16.19	12.10	8.99	8.82	3.76	1.90	2.86	2.45	1.89	100.00
Selling Price	25.546	23.494	20.919	20.089	19.979	21.984	24.868	27.935	31.124	30.819	35.004	32.069	29.145	33.904	36.381	42.075	27.758

TABLE VIII

DISTRIBUTION OF MARKED MATERIAL AND SELLING PRICES BY D.I.B. GROUPS
CUTTING METHODS COMPARED

SUGAR PINE

IMPROVEMENT CUTTING

Basis 49½ Acres

D.I.B. Groups	6-9	10-13	14-17	18-21	22-25	26-29	30-33	34-37	38-41	42-45	46-49	50-53	54-57	58-61	62-65	66-69	Total
# 1 Logs Gross Volume					33		215	649	827	828	1045	390		252	289	361	4889
% of #1 Logs					0.67		4.40	13.27	16.92	16.94	21.38	7.98		5.15	5.91	7.38	100.00
% of Total					0.19		1.19	3.59	4.58	4.59	5.79	2.16		1.40	1.60	2.00	27.09
Selling Price					30.307		36.481	38.899	40.697	41.146	41.985	42.285		42.075	42.075	42.075	40.935
#2 Logs Gross Volume				30	46	166	353	489	680	280	802	202	227				3275
% of #2 Logs				0.92	1.40	5.07	10.78	14.93	20.76	8.55	24.49	6.17	6.93				100.00
% of Total				0.17	0.25	0.92	1.96	2.71	3.77	1.55	4.44	1.12	1.26				18.15
Selling Price				20.402	22.559	25.709	27.642	29.041	30.008	30.225	30.880	30.938	30.715				29.536
#3 Logs Gross Volume		17	165	504	979	1008	1127	1734	1392	994	318	569	227	532	319		9885
% of #3 Logs		0.17	1.67	5.10	9.90	10.20	11.40	17.54	14.08	10.05	3.22	5.76	2.30	5.38	3.23		100.00
% of Total		0.09	0.91	2.79	5.42	5.58	6.24	9.61	7.71	5.51	1.77	3.15	1.26	2.95	1.77		54.76
Selling Price		23.494	20.919	20.084	19.767	21.552	22.899	24.122	25.079	25.096	25.886	25.886	25.886	25.886	25.886		23.612
Total Gross Volume		17	165	534	1058	1174	1695	2872	2899	2102	2165	1161	454	784	608	361	18,049
% of Total		0.09	0.91	2.96	5.86	6.50	9.39	15.91	16.06	11.65	12.00	6.43	2.52	4.35	3.37	2.00	100.00
Cull Per cent		1.25	2.5	3.3	4.1	4.9	5.7	6.5	7.3	8.1	8.9	9.7	10.25	10.65	11.05	11.05	7.371
Total Net Volume		17	161	516	1015	1116	1599	2686	2687	1932	1972	1048	407	700	541	321	16,718
Per cent by D.I.B. Groups		0.09	0.92	2.96	5.86	6.50	9.39	15.91	16.06	11.65	12.00	6.43	2.52	4.34	3.37	2.00	100.00
Selling Price		23.494	20.919	20.102	20.217	22.140	25.610	28.299	30.690	32.101	35.507	32.274	28.300	31.090	33.581	42.075	29.379

TABLE IX

DISTRIBUTION OF MARKED MATERIAL AND SELLING PRICES BY D.I.B. GROUPS
CUTTING METHODS COMPARED

SUGAR PINE
LIGHT CUTTING BASED ON KEEN'S MODIFICATION OF DUNNING'S TREE CLASS SYSTEM

Basis 49½ acres

D.I.B. Groups	6-9	10-13	14-17	18-21	22-25	26-29	30-33	34-37	38-41	42-45	46-49	50-53	54-57	58-61	62-65	66-69	Total
#1 Logs Gross Volume					33	58	359	1038	1081	968	1405	390		522	588	700	7142
% of #1 Logs					0.46	0.81	5.03	14.54	15.14	13.55	19.67	5.46		7.31	8.23	9.80	100.00
% of Total					0.11	0.20	1.23	3.55	3.70	3.32	4.81	1.34		1.79	2.01	2.40	24.46
Selling Price					30.307	33.309	36.481	38.899	40.697	41.146	41.985	42.285		42.075	42.075	42.075	40.866
#2 Logs Gross Volume				30	119	216	716	760	1031	566	1134	412	471				5455
% of #2 Logs				0.55	218	3.96	13.13	13.93	18.90	10.38	20.79	7.55	8.63				100.00
% of Total				0.10	0.41	0.74	2.45	2.60	3.53	1.94	3.89	1.41	1.61				18.68
Selling Price				20.402	22.559	25.709	27.642	29.041	30.008	30.225	30.880	30.938	30.715				29.512
#3 Logs Gross Volume	32	170	524	1192	2042	2174	2168	2989	1619	1554	491	569	227	532	319		16,602
% of #3 Logs	0.19	1.02	3.16	7.18	12.30	13.10	13.06	18.00	9.75	9.36	2.96	3.43	1.37	3.20	1.92		100.00
% of Total	0.11	0.58	1.80	4.08	6.99	7.44	7.43	10.24	5.55	5.32	1.68	1.95	0.78	1.82	1.09		56.86
Selling Price	28.546	23.494	20.919	20.084	19.767	21.552	22.899	24.122	25.079	25.096	25.886	25.886	25.886	25.886	25.886		23.113
Total Gross Volume	32	170	524	1222	2194	2448	3243	4787	3731	3088	3030	1371	698	1054	907	700	29,199
% of Total	0.11	0.58	1.80	4.18	7.51	8.38	11.11	16.39	12.78	10.58	10.38	4.70	2.39	3.61	3.10	2.40	100.00
Cull Per cent	0.	1.25	2.5	3.3	4.1	4.9	5.7	6.5	7.3	8.1	8.9	9.7	10.25	10.65	11.05	11.05	7.014
Total Net Volume	32	168	511	1182	2104	2328	3058	4476	3459	2838	2760	1238	626	942	807	622	27,151
Per cent by D.I.B.Groups	0.12	0.62	1.88	4.35	7.75	8.57	11.26	16.49	12.74	10.45	10.17	4.56	2.31	3.47	2.97	2.29	100.00
Selling Price	28.546	23.494	20.919	20.092	20.077	22.197	25.450	28.107	30.966	31.067	35.220	32.069	29.145	33.904	36.381	42.075	28.651

TABLE X

DISTRIBUTION OF MARKED MATERIAL AND SELLING PRICES BY D.I.B. GROUPS
CUTTING METHODS COMPARED

PONDEROSA PINE
SELECTION SYSTEM

Basis 49½ Acres

D.I.B. Groups	6-9	10-13	14-17	18-21	22-25	26-29	30-33	34-37	38-41	42-45	46-49	50-53	54-57	58-61	62-65	Total
# 1 Logs Gross Volume					646	1288	2391	4285	3860	2606	3514	1992	1342		319	22,243
% of #1 Logs					2.90	5.79	10.75	19.27	17.35	11.72	15.80	8.96	6.03		1.43	100.00
% of Total					0.66	1.32	2.44	4.38	3.94	2.66	3.59	2.04	1.37		0.33	22.73
Selling Price					29.729	29.635	30.795	32.676	31.642	31.880	31.891	32.036	31.907		31.907	31.701
#2 Logs Gross Volume				473	1418	2218	2994	3776	5168	3714	1985	1364			289	23,399
% of #2 Logs				2.02	6.06	9.48	12.79	16.14	22.09	15.87	8.48	5.83			1.24	100.00
% of Total				0.48	1.45	2.27	3.06	3.86	5.28	3.80	2.03	1.39			0.29	23.91
Selling Price				24.537	23.515	22.797	23.638	25.210	24.609	24.722	24.832	24.670			24.670	24.383
#3 Logs Gross Volume	62	756	3719	5312	9241	7900	6959	8520	5526	2392	1349		218	261		52,215
% of #3 Logs	0.12	1.45	7.12	10.17	17.70	15.13	13.33	16.32	10.58	4.58	2.58		0.42	0.50		100.00
% of Total	0.06	0.77	3.80	5.43	9.44	8.07	7.12	8.71	5.65	2.44	1.38		0.22	0.27		53.36
Selling Price	28.030	24.344	22.969	21.837	20.884	20.030	20.360	21.344	20.972	21.237	21.237		21.237	21.237		21.102
Total Gross Volume	62	756	3719	5785	11,305	11,406	12,344	16,581	14,554	8712	6848	3356	1560	261	608	97,857
% of Total	0.06	0.77	3.80	5.91	11.55	11.66	12.62	16.95	14.87	8.90	7.00	3.43	1.59	0.27	0.62	100.00
Cull per cent	0.	0.7	1.5	2.3	3.1	3.9	4.35	4.75	5.15	5.55	5.95	6.35	6.50	6.75	6.75	4.422
Total Net Volume	62	751	3660	5652	10,955	10,961	11,807	15,794	13,805	8229	6441	3143	1459	243	567	93,529
% by D.I.B. Groups	0.07	0.80	3.92	6.04	11.71	11.72	12.62	16.89	14.76	8.80	6.89	3.36	1.56	0.26	0.60	100.00
Selling Price	28.030	24.344	22.969	22.058	21.719	21.653	23.176	25.153	25.093	25.906	27.746	29.042	30.416	21.237	28.467	24.296

TABLE XI

DISTRIBUTION OF MARKED MATERIAL AND SELLING PRICES BY D.I.B. GROUPS
CUTTING METHODS COMPARED

PONDEROSA PINE

IMPROVEMENT CUTTING

Basis 49½ acres

D.I.B. Groups	6-9	10-13	14-17	18-21	22-25	26-29	30-33	34-37	38-41	42-45	46-49	50-53	54-57	58-61	62-65	Total
#1 Logs Gross Volume					79	520	1326	2095	2168	2006	1536	1580	671		319	12,300
% of #1 Logs					0.64	4.23	10.78	17.03	17.63	16.31	12.49	12.85	5.45		2.59	100.00
% of Total					0.18	1.18	3.01	4.76	4.92	4.55	3.49	3.59	1.52		0.72	27.92
Selling Price					29.729	29.635	30.795	32.676	31.642	31.880	31.891	32.036	31.907		31.907	31.771
#2 Logs Gross Volume				121	374	1035	1628	1613	2924	2146	1155	577			289	11,862
% of #2 Logs				1.02	3.15	8.72	13.72	13.60	24.65	18.09	9.74	4.87			2.44	100.00
% of Total				0.27	0.85	2.35	3. 69	3.66	6.64	4.87	2.63	1.31			0.66	26.93
Selling Price				24.537	23.515	22.797	23.638	25.210	24.609	24.722	24.832	24.670			24.670	24.411
#3 Logs Gross Volume	4	147	1105	1676	2940	3096	2276	3455	2892	1138	685		218	261		19,893
% of #3 Logs	0.02	0.74	5.56	8.42	14.78	15.56	11 .44	17.37	14.54	5.72	3.44		1.10	1.31		100.00
% of Total	0.01	0.33	2.51	3.81	6.67	7.03	5.17	7.84	6.56	2.58	1.55		0.50	0.59		45.15
Selling Price	28.030	24.344	22.969	21.837	20.884	20.030	20.360	21.344	20.972	21.237	21.237		21.237	21.237		21.048
Total Gross Volume	4	147	1105	1797	3393	4651	5230	7163	7984	5290	3376	2157	889	261	608	44,055
% of Total	0.01	0.33	2.51	4.08	7.70	10.56	11.87	16.26	18.12	12.01	7.66	4.90	2.02	0.59	1.38	100.00
Cull per cent	0.	0.7	1.5	2.3	3.1	3.9	4. 3 5	4.75	5.15	5.55	5.95	6.35	6.50	6.75	6.75	4.704
Total Net Volume	4	146	1088	1756	3288	4470	5002	6823	7573	4997	3175	2020	831	243	567	41,983
% by D.I.B. Groups	0.01	0.35	2.59	4.18	7.83	10.65	11.92	16.25	18.04	11.90	7.56	4.81	1.98	0.58	1.35	100.00
Selling Price	28.030	24.344	22.969	22.019	21.380	21.720	24.026	25.529	25.201	26.687	27.314	30.065	29.290	21.237	28.467	24.947

TABLE XII

DISTRIBUTION OF MARKED MATERIAL AND SELLING PRICES BY D.I.B. GROUPS
CUTTING METHODS COMPARED

PONDEROSA PINE
LIGHT CUTTING BASED ON KEEN'S MODIFICATION OF DUNNINGS TREE CLASS SYSTEM

Basis 49½ Acres

D.I.B. Groups	6-9	10-13	14-17	18-21	22-25	26-29	30-33	34-37	38-41	42-45	46-49	50-53	54-57	58-61	62-65	Total
#1 Logs Gross Volume					552	1123	2097	3352	3478	2718	2027	1580	889		319	18,135
% of #1 Logs					3.05	6.19	11.56	18.48	19.18	14.99	11.18	8.71	4.90		1.76	100.00
% of Total					0.76	1.56	2.90	4.64	4.82	3.76	2.81	2.19	1.23		0.44	25.11
Selling Price					29.729	29.635	30.795	32.676	31.642	31.880	31.891	32.036	31.907		31.907	31.668
#2 Logs Gross Volume				445	1001	1939	2545	2592	4213	2426	1155	779			289	17,384
% of #2 Logs				2.56	5.76	11.15	14.64	14.91	24.24	13.96	6.64	4.48			1.66	100.00
% of Total				0.62	1.39	2.68	3.53	3.59	5.84	3.36	1.60	1.08			0.40	24.09
Selling Price				24.537	23.515	22.797	23.638	25.210	24.609	24.722	24.832	24.670			24.670	24.324
#3 Logs Gross Volume	96	725	2835	4006	6866	6006	4207	5618	3692	1290	858		218	261		36,678
% of #3 Logs	0.26	1.98	7.73	10.92	18.72	16.37	11.47	15.32	10.07	3.52	2.34		0.59	0.71		100.00
% of Total	0.13	1.00	3.93	5.55	9.51	8.32	5.83	7.78	5.11	1.79	1.19		0.30	0.36		50.80
Selling Price	28.030	24.344	22.969	21.837	20.884	20.030	20.360	21.344	20.972	21.237	21.237		21.237	21.237		21.141
Total Gross Volume	96	725	2835	4451	8419	9068	8849	11,562	11,383	6434	4040	2359	1107	261	608	72,197
% of Total	0.13	1.00	3.93	6.17	11.66	12.56	12.26	16.01	15.77	8.91	5.60	3.27	1.53	0.36	0.84	100.00
Cull per cent	0.	0.7	1.5	2.3	3.1	3.9	4.35	4.75	5.15	5.55	5.95	6.35	6.50	6.75	6.75	4.381
Total Net Volume	96	720	2792	4349	8158	8714	8464	11,013	10,797	6077	3800	2209	1035	243	567	69,034
Per cent by D.I.B. Groups	0.14	1.04	4.05	6.30	11.82	12.62	12.26	15.96	15.64	8.80	5.50	3.20	1.50	0.35	0.82	100.00
Selling Price	28.030	24.344	22.969	22.107	21.777	21.811	23.776	25.496	25.578	27.047	27.610	29.603	29.806	21.237	28.467	24.552

The interesting fact shown by these tables is that the average selling price for ponderosa pine and sugar pine is highest for the improvement cutting method with the light cutting and selection systems following in order.

In order to give a clear picture of the treatment accorded the timber stand, Tables XIII to XIV are included. These tables show the volume per acre and the percentage of material cut and left by tree classes for the selection, improvement and light cutting methods.

Table XIII shows the volume and per cent of timber removed per acre in the classes by volume cut and by total volume for three of the cutting methods. A comparison between the selection and light cutting methods indicates that the treatment accorded the Dunning Class 4 and 5 trees constitutes the difference. In turn, reference to Table XIV shows for these two methods that all of the additional leave obtained in the light cutting is in these classes of trees.

TABLE XIII
TIMBER REMOVED PER ACRE BY SPECIES, TREE CLASSES AND PER CENT OF TOTAL STAND

	PONDEROSA PINE								SUGAR PINE								WHITE FIR								INCENSE CEDAR								JEFFREY PINE							
	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total
A-Standard Group Selection																																								
Volume Cut Per Acre	12	248	1947	15,797	42			18,046	26	506	6055	2				6589	29	910	4975	10				5924	32	12	1223	4003	3	13		5286				630		2		632
% Cut Per Acre	0.03	0.68	5.34	43.31	0.11			49.47	0.07	1.38	16.60	0.01				18.06	0.08	2.49	13.64	0.03				16.24	0.09	0.03	3.35	10.97	0.01	0.04		14.49				1.73		0.01		1.74
% Total Vol. per A.(Cut & Leave)	0.03	0.55	4.33	35.12	0.09			40.12	0.06	1.13	13.46					14.65	0.06	2.03	11.06	0.02				13.17	0.07	0.03	2.71	8.90	0.01	0.03		11.75				1.41				1.41
B-Improvement Cutting																																								
Volume Cut Per Acre		108	83	8155				8346		21	3247					3268		78	2512					2590		159	2238					2397				236				236
% Cut Per Acre		0.64	0.49	48.44				49.57		0.13	19.28					19.41		0.46	14.92					15.38		0.95	13.29					14.24				1.40				1.40
% Total Vol. Per A.(Cut & Leave)		0.24	0.18	18.13				18.55		0.05	7.22					7.27		0.17	5.59					5.76		0.35	4.98					5.33				0.52				0.52

	TOTAL							
	1	2	3	4	5	6	7	Total
A-Standard Group Selection								
Volume Cut Per Acre	44	315	4586	31,460	13	59		36,477
% Cut Per Acre	0.12	0.86	12.57	86.25	0.04	0.16		100.00
% Total Vol. per A.(Cut & Leave)	0.10	0.70	10.20	69.94	0.03	0.13		81.10
B-Improvement Cutting								
Volume Cut Per Acre		108	341	16,388				16,837
% Cut Per Acre		0.64	2.03	97.33				100.00
% Total Vol. per A.(Cut & Leave)		0.24	0.76	36.43				37.43

	PONDEROSA PINE																SUGAR PINE															
	1				2				3				4					1				2				3				4			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total
D-Light Cutting Based on Keen's Modification Dunning Tree Class System																																	
Volume Cut Per Acre	2	2			7				249	6	925	1	165	6743	5332	42	13,474									26		162		3289	2181	3		5661
% Cut Per Acre	0.01	0.01			0.03				0.85	0.02	3.17		0.57	23.13	18.29	0.14	46.22									0.09		0.56		11.28	7.48	0.01		19.42
% Total Vol.per A.(Cut & Leave)	-	-			0.02				0.55	0.01	2.06		0.37	14.99	11.86	0.10	29.96									0.06		0.36		7.31	4.84	0.01		12.58

	WHITE FIR																INCENSE CEDAR															
	1				2				3				4					1				2				3				4			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total
D-Light Cutting Based on Keen's Modification Dunning Tree Class System																																	
Volume Cut Per Acre					10				29	24	382		206	3284	1063		4998	12	6			16				65	44	513	4	56	1707	1952	13	4388
% Cut Per Acre					0.03				0.10	0.08	1.31		0.71	11.26	3.65		17.14	0.04	0.02			0.05				0.22	0.15	1.76	0.01	0.19	5.86	6.70	0.05	15.05
% Total Vol.per A.(Cut & Leave)					0.02				0.07	0.05	0.85		0.46	7.30	2.36		11.11	0.03	0.01			0.04				0.14	0.10	1.14	0.01	0.12	3.79	4.34	0.03	9.75

TABLE XIII (Con't.)
TIMBER REMOVED PER ACRE BY SPECIES, TREE CLASSES AND PER CENT OF TOTAL STAND

	JEFFREY PINE																TOTALS											
	1				2				3				4					1				2				3				4				
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	TOTAL	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total
D-Light Cutting Based on Keen's Modification Dunning Tree Class System																																	
Volume Cut Per Acre													398	232	2		632		14	8			23	10		369	74	1982	5	427	15,421	10,760	60	29,153
% Cut Per Acre													1.36	0.80	0.01		2.17		0.05	0.03			0.08	0.03		1.27	0.25	6.80	0.02	1.46	52.89	36.91	0.21	100.00
% Total Vol.per A. (Cut & Leave)													0.89	0.52			1.41		0.03	0.02			0.05	0.02		0.82	0.16	4.41	0.01	0.95	34.29	23.92	0.13	64.81

	PONDEROSA PINE								SUGAR PINE								WHITE FIR								INCENSE CEDAR								JEFFREY PINE							
	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total
"D" System Combined so as to compare with Dunnings "7" Classes																																								
Volume per Acre	9	249	931	12,240	2	43		13,474		26	162	5470		3		5661		29	406	4553	10			4,998	28	65	557	3715	6	17		4388				630		2		632
% Cut Per Acre	0.04	0.85	3.19	41.99	0.01	0.14		46.22		0.09	0.56	18.76		0.01		19.42		0.10	1.39	15.62	0.03			17.14	0.09	0.22	1.91	12.75	0.02	0.06		15.05				2.16		0.01		2.17
% Total Vol. (Cut & Leave)	0.02	0.55	2.07	27.22		0.10		29.96		0.06	0.36	12.15		0.01		12.58		0.07	0.90	10.12	0.02			11.11	0.07	0.14	1.24	8.25	0.01	0.04		9.75				1.41				1.41

	TOTALS							
	1	2	3	4	5	6	7	Total
"D" System Combined so as to compare with Dunnings"7" Classes								
Volume per Acre	37	369	2056	26,608	18	65		29,153
% Cut per Acre	0.13	1.27	7.05	91.26	0.06	0.23		100.00
% Total Vol. (Cut & Leave)	0.08	0.82	4.57	59.16	0.04	0.14		64.81

TABLE XIV
RESERVE TIMBER PER ACRE BY SPECIES, TREE CLASSES AND % OF TOTAL STAND

	PONDEROSA PINE								SUGAR PINE							
	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total
A-Standard Group Selection:																
Volume Leave per Acre	318	205	3349	407	108	23	3	4413	143	35	826	84		10		1098
% Leave per Acre	3.74	2.41	39.39	4.79	1.27	0.27	0.03	51.90	1.68	0.41	9.72	0.99		0.12		12.92
% of Total (Leave & Cut)	0.71	0.45	7.45	0.90	0.24	0.05	0.01	9.81	0.32	0.08	1.83	0.19		0.02		2.44
B-Improvement Cutting																
Volume Leave per Acre	318	217	3489	2270	7750	23	46	14,113	143	35	852	782	2594	10	3	4419
% Leave per Acre	1.13	0.77	12.40	8.07	27.54	0.08	0.16	50.15	0.51	0.12	3.03	2.78	9.22	0.03	0.01	15.70
% of Total (Leave & Cut)	0.71	0.48	7.76	5.05	17.23	0.05	0.10	31.38	0.32	0.08	1.89	1.73	5.77	0.02	0.01	0.82

	WHITE FIR								INCENSE CEDAR								JEFFREY PINE							
	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total
A-Standard Group Selection:																								
Volume Leave per Acre	213	423	648	128		12		1424	253	347	686	88		20	1	1395	63	14	96					173
% Leave per Acre	2.50	4.97	7.63	1.51		0.14		16.75	2.97	4.08	8.07	1.03		0.24	0.01	16.40	0.74	0.16	1.13					2.03
% of Total (Leave & Cut)	0.47	0.94	1.44	0.28		0.03		3.16	0.56	0.77	1.53	0.20		0.04		3.10	0.14	0.03	0.22					0.39
B-Improvement Cutting																								
Volume Leave per Acre	213	423	677	960	2463	22		4758	253	379	698	1152	1765	23	14	4284	63	14	96		394	2	569	
% Leave per Acre	0.76	1.50	2.41	3.41	8.75	0.08		16.91	0.90	1.35	2.48	4.09	6.27	0.08	0.05	15.22	0.23	0.05	0.34		1.39	0.01	2.02	
% of Total (Leave & Cut)	0.47	0.94	1.51	2.13	5.48	0.05		10.58	0.56	0.84	1.55	2.56	3.93	0.05	0.03	9.52	0.14	0.03	0.22		0.88		1.27	

	TOTAL							
	1	2	3	4	5	6	7	Total
A-Standard Group Selection								
Volume Leave per Acre	990	1024	5605	707	108	65	4	8503
% Leave per Acre	11.64	12.04	65.92	8.32	1.27	0.76	0.05	100.00
% of Total (Leave & Cut)	2.20	2.28	12.46	1.57	0.24	0.14	0.01	18.90
B-Improvement Cutting								
Volume Leave per Acre	990	1068	5812	5164	14,966	78	65	28,143
% Leave per Acre	3.52	3.79	20.65	18.35	53.18	0.28	0.23	100.00
% of Total (Leave & Cut)	2.20	2.38	12.92	11.48	33.27	0.17	0.15	62.57

	PONDEROSA PINE																	SUGAR PINE												
	1				2				3				4					1				2				3				4			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total
D-Light Cutting Based on Keen's Classification- Dunning Tree Class System																																	
Volume Leave per Acre:	169	25	2		150	192	17	5	3069	1527	29	1	3796					3				8985				42	8	3		84	44	6	1	750	703			385				2026
% Leave per Acre cut:	1.07	0.16	0.01		0.95	1.21	0.11	0.03	19.39	9.65	0.18	0.01	23.98					0.02				56.77				0.26	0.05	0.02		0.53	0.28	0.04	0.01	4.74	4.44			2.43				12.80
% of Total (Leave &/):	0.38	0.06			0.33	0.43	0.04	0.01	6.82	3.40	0.06		8.44					0.01				19.98				0.09	0.02	0.01		0.19	0.10	0.01		1.66	1.56			0.86				4.50

	WHITE FIR																	INCENSE CEDAR																
	1				2				3				4					1				2				3				4				
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	TOTAL
D-Light Cutting Based on Keen's Classification - Dunning Tree Class System																																		
Volume Leave per Acre	83	47	11	3	69	571	13	2	391	868	2		290				2350	90	60	8	5	132	290	24	9	703	815	1		155			1	2293
% Leave per Acre	0.53	0.30	0.07	0.02	0.44	3.61	0.08	0.01	2.47	5.48	0.01		1.83				14.85	0.57	0.38	0.05	0.03	0.83	1.83	0.15	0.06	4.44	5.15	0.01		0.98			0.01	14.49
% of Total (Leave & Cut)	0.18	0.11	0.03	0.01	0.15	1.27	0.03		0.87	1.93			0.65				5.23	0.22	0.13	0.02	0.01	0.29	0.64	0.05	0.02	1.56	1.81			0.35				5.10

TABLE XIV (Con't.)
RESERVE TIMBER PER ACRE BY SPECIES, TREE CLASSES AND % OF TOTAL STAND

	JEFFREY PINE																	TOTAL													
	1				2				3				4					1				2				3				4			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	Total
D-Light Cutting Based on Keen's Classification - Dunning Tree Class System																																	
Volume Leave Per Acre	20				25	11	4		113								173	404	140	24	8	460	1108	64	17	5026	3913	32	1	4626		4		15,827
% Leave Per Acre	0.13				0.16	0.07	0.02		0.71								1.09	2.55	0.88	0.15	0.05	2.91	7.00	0.41	0.11	31.76	24.72	0.20	0.01	29.23		0.02		100.00
% of Total (Leave & Cut)	0.04				0.06	0.02	0.01		0.25								0.38	0.90	0.31	0.05	0.02	1.02	2.46	0.14	0.04	11.18	8.70	0.07		10.29		0.01		35.19

	PONDEROSA PINE								SUGAR PINE								WHITE FIR								INCENSE CEDAR								JEFFREY PINE							
	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total	1	2	3	4	5	6	7	Total
"D" System Combined so as to compare with Dunning's "7" Classes																																								
Volume Per Acre	319	217	3069	1556	3796	24	4	8985	126	52	750	703	385	10		2026	152	618	391	870	290	29		2350	222	350	703	816	155	46	1	2293	45	11	113			4		173
% Leave Per Acre	2.02	1.37	19.39	9.83	23.98	0.15	0.03	56.77	0.79	0.33	4.74	4.44	2.43	0.07		12.80	0.97	3.91	2.47	5.49	1.83	0.18		14.85	1.40	2.21	4.44	5.16	0.98	0.29	0.01	14.49	0.29	0.07	0.71			0.02		0.09
% Total Volume (Cut & Leave)	0.71	0.49	6.82	3.46	8.44	0.05	0.01	19.98	0.28	0.12	1.66	1.56	0.86	0.02		4.50	0.33	1.38	0.87	1.93	0.65	0.07		5.23	0.51	0.77	1.56	1.81	0.35	0.10		5.10	0.10	0.02	0.25			0.01		0.38

	TOTAL							
	1	2	3	4	5	6	7	Total
"D" System Combined so as to compare with Dunning's "7" Classes								
Volume Per acre	864	1248	5026	3945	4626	113	5	15,827
% Leave Per acre	5.46	7.88	31.76	24.92	29.23	0.72	0.03	100.00
% Total Volume (Cut & Leave)	1.92	2.77	11.18	8.77	10.29	0.25	0.01	35.19

SUMMARY:

A study of the various tables indicates:

1. The selection method gives a cut of approximately 80 per cent.

2. The improvement cutting shows that only 37 per cent of the stand will be removed.

3. The improvement cutting method with the addition of removing all trees with 2 or more number 1 quality logs increases the volume removed to 45 per cent.

4. The light cutting method based on Keen's modification of Dunning's tree classes removes 65 per cent of the stand.

5. The additional volume removed by cutting all trees with 2 or more number 1 quality logs in the light cutting method increases the volume removed to 67 per cent.

6. The percentage composition of the stand remains practically the same after cutting irrespective of the type of treatment.

7. The average annual growth is increased by 21 per cent under the light cutting method as contrasted with the selection system.

8. The average selling price of lumber is greatest for the improvement cutting with the light cutting and the selection systems following in order.

9. The additional volume left in the light cutting treatment is confined to the Dunning Class 4 and 5 trees (Keen Class 3A, 3B and 4A)

CONCLUSION:

The study shows that there are two cutting systems that give promise of meeting the criticism levelled against the present policy. These systems, improvement cutting and light cutting, both leave a larger residual stand, show a higher average annual growth rate and give a higher average selling price for the lumber. The improvement cutting method on the one hand while based on Dunning's tree classes involves personal judgment to a large extent. On the other hand, the light cutting method is based on a modification of the Dunning system. It is flexible and can, by ~~the~~ tree designation, be adapted to any degree of cutting desired. Further, it is simple and easy to apply and removes much of the uncertainity as to classification that exists in the Dunning tree class system.